

Amtd. dated June 14, 2004
Reply to Office action of June 12, 2004

Serial No. 09/535,859
Docket No. BLD990050US1
Firm No. 0036.0060

REMARKS/ARGUMENTS

On page 5 of the Office Action, the Examiner objected to claims 3, 6, 8-14, 17, 20, 22-28, 33, and 35-38 and found that these claims would be allowed if rewritten in independent form including the requirements of the base and any intervening claims. Applicants note that in the Office Action Summary page, the Examiner did not include claims 3 and 6 in the list of "objected to" claims. However, Applicants are following the finding on page 5 of the Office Action because claims 3 and 6 include substantially the same requirements of allowed claims 17 and 20 in method form.

Applicants amended allowable claims 3, 6, 17, 20, 33, and 36 to include the requirements of the base and any intervening claims to place these claims in condition for allowance. Further, claims 34 and 35 are now in condition for allowance because they depend from amended claim 33, which is now in condition for allowance.

Applicants further added claims 39-52 which include the requirements of pending method claims 1-14 in article of manufacture format. Applicants submit that these new claims 39-52 are patentable over the cited art for the reasons discussed below with respect to claims 1-14.

The Examiner rejected claims 1, 2, 4, 5, 7, 15, 16, 18, 19, and 21 as anticipated (35 U.S.C. §102) by Bacon (U.S. Patent No. 4,280,144) Applicants traverse for the following reasons.

Claims 1 and 15 concern reducing toner in an image comprised of raster pel data and require: determining surrounding pels of subject pels; for each subject pel, generating a sub-pulse width power to charge a sub-pel region within the subject pel based on a pattern of the surrounding pels of the subject pel; and for each subject pel, generating position information indicating an alignment of the sub-pel region in the pel, wherein the position information is used to position the sub-pel region produced by the sub-pulse width power in the pel.

The Examiner cited Bacon's discussion of surrounding pixels (W, Y, Z and V) with respect to a subject PEL X. Bacon discusses how a coarse PEL X may be processed to reproduce the PEL X at a higher resolution by taking four sums of adjoining coarsely scanned PELs (W, Y, Z, and V) surrounding PEL X. (Bacon, col. 5, lines 7-10). Bacon discusses how a PEL X is subdivided into 4 sub-pels X(1-4), where the value of each sub-pel is based on the sum of one or more grey scale codes V', Y', W', and Z' that represent grey scale codes for PELs V,

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Y, W, and Z, respectively, that surround PEL X. The new PEL X is thus the sum of the four calculated sub-pels X(1-4). (Bacon, col. 5, lines 14-69). Applicants note that the Examiner did not cite specific sections of Bacon in making his rejection of claims 1 and 15. However, the above discussed Bacon mentions the elements that the Examiner cited, such as pels X(1-4) and surrounding pixels (W, Y, Z and V).

Claims 1 and 15 require reducing toner in an image. Nowhere does the cited Bacon anywhere disclose that its described technique for increasing resolution is used to reduce toner in an image. Bacon mentions that its object is to reproduce a fine print of a coarsely scanned document from less information. (Bacon, col. 3, lines 6-10; col. 6, lines 49-54). The Examiner has not cited any part of Bacon that discloses reducing toner in an image as claimed.

Further, nowhere does the cited Bacon anywhere disclose the claim requirement that for each subject pel, generating a sub-pulse width power to charge a sub-pel region within the subject pel based on a pattern of the surrounding pels of the subject pel. Bacon mentions that sub-pel values for PEL X, which are sub-PELs X(1-4), are calculated using the grey scale code of the pels surrounding PEL X. The claims require that the sub-pulse width be determined based on a pattern of the surrounding pels of the subject pel. The cited Bacon does not determine sub-pel values, such as X(1-4), based on the pattern of surrounding pels, e.g., W, Y, Z, and V. Instead, Bacon calculates sub-pels values based on the grey code value of surrounding pels, not the pattern of surrounding pels as claimed.

If the Examiner maintains the rejection of these claims, Applicants request that the Examiner cite to specific sections of the cited references that disclose the dependent claim requirements. See, 37 CFR 1.104(c)(2) ("When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable"); MPEP 707, pg. 700-100.

Accordingly, independent claims 1 and 15 are patentable over the cited art because the cited Bacon does not disclose all the claim requirements.

Claims 2, 4, 5, 7, 16, 18, 19, and 21 are patentable over the cited art because they depend from one of claims 1 and 15, which are patentable over the cited art for the reasons discussed above. Moreover, claims 4 and 18 provide further grounds of patentability over the cited art.

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Claims 4 and 18 depend from claims 1 and 15 and further require that for each subject pel, determining whether the pattern of the surrounding pels indicates that the subject pel is in a black filled region, wherein the position information is used to align the sub-pel region in the subject pel in the black filled region to be adjacent to the sub-pel region in one adjacent subject pel in the black filled region.

The Examiner cited the above discussed sub-pels X(1-4) of PEL X and the adjacent pels W, Y, V, and Z of PEL X as disclosing the additional requirements of claims 4 and 18.

Applicants submit that the Examiner has not cited any section in Bacon that discloses determining whether a pattern of surrounding pels indicates that the subject pel is in a black filled region. In fact, the above cited Bacon discusses how to calculate sub-pels based on surrounding pel grey scale codes.

The Examiner cited FIG. 3 as disclosing this claim requirement. (Office Action, pg. 3) Applicants traverse. The cited FIG. 3 shows the range of grey level value within which a PEL may fall. (Bacon, col. 4, lines 6-7). Nowhere does the cited FIG. 3 disclose the claim requirement of determining from the pattern of surrounding pels whether the subject pel is in a black filled region.

Further, the Examiner has not cited any part of Bacon that discloses the claim requirement that the position information is used to align the sub-pel region in the subject pel in the black filled region to be adjacent to the sub-pel region in one adjacent subject pel in the black filled region.

FIG. 4 and col. 5, lines 38-55 of Bacon mentions that the sub-pels X(1-4) comprise subdivided regions of pel X. The Examiner has not cited any part of Bacon that discloses the claim requirement that the sub-pel in a black filled region is aligned to be adjacent to the sub-pel region in one adjacent subject pel in the black filled region.

Accordingly, claims 4 and 18 provide additional grounds of patentability over the cited art because the cited Bacon does not disclose the additional requirements of these claims.

The Examiner rejected claims 29-32 and 34 as anticipated (35 U.S.C. §102(b)) by Seto (U.S. Patent No. 5,646,670). Applicants traverse for the following reasons.

Claim 29 recites a computer-readable transmission medium including a look-up table data structure used for reducing toner in an image comprised of raster pel data, comprising: a plurality

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of output values, wherein one output value is provided for at least one pattern of pels including a subject pel, wherein the output value is substituted for the subject pel, and wherein the output value comprises a sub-pulse width power to charge a sub-pel region within the subject pel and position information indicating an alignment of the sub-pel region in the pel, wherein the position information is used to position the sub-pel region produced by the sub-pulse width power in the pel.

Applicants corrected claim 29 to remove the word "based".

The Examiner cited 8 distinct pulse widths of Seto as disclosing the claim requirement of a plurality of output values, wherein one output value is provided for at least one pattern of pels including a subject pel. (Office Action, pg. 4) Applicants traverse.

The Examiner did not cite to a specific section of Seto as disclosing these "8 distinct pulse widths". Seto mentions that LUT 1152 outputs an 8 bit data to a D/A converter to convert the data into an analog voltage signal. (Seto, col. 19, lines 20-25) Seto also mentions that the YMCK VDO signal from a color processor is corrected and outputted as an 8 bit signal to a pulse width modulator, which is converted by a D/A converter and outputted to an analog comparator. (Seto, col. 3, lines 37-45)

Nowhere does the above cited Seto anywhere disclose a plurality of output values, wherein one output value is provided for at least one pattern of pels including a subject pel. Instead, the above cited Seto just discusses an 8 bit signal sent to a pulse width modulator.

The Examiner cited FIG. 34 as disclosing the claim requirement that the output value is substituted for the subject pel. The cited FIG. 34 shows image output and discusses adding three scanning lines to reduce the toner output per unit area. (Seto, col. 21, lines 24-35) However, nowhere does the cited Seto disclose the claim requirement that the output value is substituted for the subject pel.

If the Examiner maintains the rejection of these dependent claims, Applicants request that the Examiner cite to specific sections of the cited references that disclose the dependent claim requirements.

Accordingly, independent claim 29 is patentable over the cited art because the cited Seto does not disclose all the claim requirements.

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Claims 30-32 and 34 are patentable over the cited art because they depend from claim 29, which is patentable over the cited art for the reasons discussed above. Moreover, the following of these dependent claims provide further grounds of patentability over the cited art.

Claim 31 depends from claim 29, and further requires that the position information clusters the sub-pel region of adjacent pels in order to reduce electromanetic radiation.

The Examiner cited col. 9, line 12, col. 20, lines 19-24, 34-38, and 47-55 of Seto as disclosing the requirements of claim 31.. (Office Action, pg. 4) Applicants traverse.

The cited col. 9 mentions that a latent image is developed using M color developer Dm as a first toner. The cited col. 20 mentions a printer having a toner-saving processor and various components thereof. The cited col. 20 further mentions how if the toner saving mode destination signal is 0, in non-toner saving mode, then a clock phase controller 1164 outputs a value . A selector output signal is outputted to the laser driver.

Although the cited Seto discusses operations of a toner saving processor, nowhere does the cited Seto anywhere disclose the claim requirement that the position information cluster the sub-pel region of adjacent pels in order to reduce electromanetic radiation. Nowhere does the cited col. 9 anywhere disclose the claim requirement of clustering the sub-pel region of adjacent pels.

Accordingly, claim 31 provides additional grounds of patentability over the cited art because the cited Bacon does not disclose the additional requirements of these claims.

Claim 32 depends from claim 29 and further requires that the output values for subject pels in a black filled region include position information that aligns the sub-pel region in the subject pels in the black filled region to be adjacent to the sub-pel region in one adjacent subject pel in the black filled region. The Examiner cited FIG. 14b as disclosing the requirements of these claims. (Office Action, pg. 5) Applicants traverse.

The cited FIG. 14b illustrates printed pixels upon normal mode outputting, not toner saving mode. (Seto, col. 7, lines 19-20; col. 15, lines 11-28) Nowhere does the discussion in Seto concerning FIG. 14b disclose aligning sub-pels in a black filled region to be adjacent to the sub-pel region in one adjacent pel. Instead, FIG.14b shows normal printed pels and nowhere does the above cited Seto disclose the claim requirements concerning how sub-pels are positioned in adjacent pels in a black filled region.

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Further, although FIG. 14b may show sub-pels in adjacent pels adjacent to each other, nowhere does the discussion concerning FIG. 14b in Seto disclose including position information with output values for pels in a black filled region that aligns the sub pels in the pels adjacent to each other as claimed.

Accordingly, claim 32 provides additional grounds of patentability over the cited art because the cited Bacon does not disclose the additional requirements of these claims.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-52 are patentable over the art of record. Applicants submit herewith the fees for the claim amendments. Nonetheless, should any additional fees be required, please charge Deposit Account No. 50-0563.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

Dated: June 14, 2004

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